

THAT WHICH IS CLAIMED IS:

1. A wireless terminal comprising:
5 a housing;
an electronic circuit disposed within the housing;
a flat-panel speaker positioned proximate a back side of the electronic circuit
within the housing; and
an internal antenna positioned proximate the flat-panel speaker on the back
10 side of the electronic circuit within the housing.
2. The wireless terminal of Claim 1, wherein the flat-panel speaker is
integrated with the internal antenna.
- 15 3. The wireless terminal of Claim 2, wherein the flat-panel speaker and
the internal antenna each comprise conductive portions that reside on a first primary
surface of a common substrate.
4. The wireless terminal of Claim 1, wherein the internal antenna is a
20 planar antenna.
5. The wireless terminal of Claim 1, wherein the housing includes an
earpiece and a keyboard on a front face of the housing, and wherein the electronic
circuit is positioned between the front face of the housing and the flat panel speaker
25 and internal antenna.
6. The wireless terminal of Claim 5, wherein the electronic circuit
comprises a printed circuit board, and wherein the wireless terminal further comprises
a forward acoustic passageway extending from the flat-panel speaker to the earpiece,
30 the forward acoustic passageway comprising at least one acoustic aperture extending
through the printed circuit board adjacent the flat-panel speaker.
7. The wireless terminal of Claim 6, wherein the internal antenna is
positioned between the printed circuit board and the flat-panel speaker and wherein

the forward acoustic passageway further comprises at least one acoustic aperture extending through the internal antenna.

8. The wireless terminal of Claim 1, wherein the electronic circuit
5 comprises a printed circuit board having a signal feed and a ground plane, and wherein the internal antenna is operatively coupled to the signal feed and the ground plane.

9. The wireless terminal of Claim 1, wherein the electronic circuit
10 includes an audio driver circuit coupled through a balanced feed to the flat-panel speaker.

10. The wireless terminal of Claim 9, wherein the balanced feed comprises
15 a plurality of leads, and wherein the electronic circuit further comprises an RF isolation circuit on each lead of the balanced feed.

11. The wireless terminal of Claim 10, wherein the RF isolation circuit comprises a tank circuit.

20 12. The wireless terminal of Claim 10, wherein the RF isolation circuit comprises an inductor.

13. The wireless terminal of Claim 1, wherein the flat-panel speaker is
25 configured to act as a parasitic element to the internal antenna.

14. The wireless terminal of Claim 13, wherein the flat-panel speaker is configured to act as a parasitic element that provides a lower frequency range frequency response for the internal antenna.

30 15. The wireless terminal of Claim 13, wherein the flat-panel speaker is configured to act as a parasitic element that provides an increased bandwidth frequency response for the internal antenna.

16. The wireless terminal of Claim 13, wherein the flat-panel speaker is configured to act as a parasitic element that provides a multi-band frequency response for the internal antenna.

5 17. The wireless terminal of Claim 1, wherein the internal antenna comprises a planar inverted-F antenna (PIFA).

18. The wireless terminal of Claim 1, wherein the internal antenna comprises a single-contact patch antenna.

10

19. The wireless terminal of Claim 1, wherein the internal antenna comprises a monopole antenna.

20. The wireless terminal of Claim 2, wherein the electronic circuit
15 comprises:

an audio driver circuit coupled to the flat-panel speaker through a balanced feed comprising a plurality of leads;

an antenna driver circuit in communication with the internal antenna; and

a signal compensation circuit in communication with the audio driver circuit
20 and the antenna driver circuit, wherein when the internal antenna is in transmit mode the signal compensation circuit compensates a signal from the audio driver circuit to the flat-panel speaker.

21. An antenna subassembly comprising:

25 a planar antenna; and

a flat-panel speaker, wherein the flat-panel speaker is integrated with the planar antenna.

22. The antenna subassembly of Claim 21, wherein the flat-panel speaker
30 and the planar antenna each comprise conductive portions that reside on a first primary surface of a common substrate.

23. The antenna subassembly of Claim 21, wherein the antenna subassembly further comprises an electronic circuit including an audio driver circuit coupled through a balanced feed to the flat-panel speaker.

5 24. The antenna subassembly of Claim 23, wherein the balanced feed comprises a plurality of leads, and wherein the electronic circuit further comprises an RF isolation circuit on each lead of the balanced feed.

 25. The antenna subassembly of Claim 24, wherein the RF isolation circuit
10 comprises a tank circuit.

 26. The antenna subassembly of Claim 24, wherein the RF isolation circuit comprises an inductor.

15 27. The antenna subassembly of Claim 21, wherein the flat-panel speaker is configured to act as a parasitic element to the planar antenna.

 28. The antenna subassembly of Claim 27, wherein the flat-panel speaker is configured to act as a parasitic element that provides a lower frequency range
20 frequency response for the planar antenna.

 29. The antenna subassembly of Claim 27, wherein the flat-panel speaker is configured to act as parasitic element that provides an increased bandwidth frequency response for the planar antenna.
25

 30. The antenna subassembly of Claim 27, wherein the flat-panel speaker is configured to act as a parasitic element that provides a multi-band frequency response for the planar antenna.

30 31. The antenna subassembly of Claim 21, wherein the planar antenna comprises a planar inverted-F antenna (PIFA).

 32. The antenna subassembly of Claim 21, wherein the planar antenna comprises a single-contact patch antenna.

33. The antenna subassembly of Claim 21, wherein the planar antenna comprises a monopole antenna.

5